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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of	)	
	)	
Amendment of Part 15 of the	)	RM-8435
Rules with Regard to the	)	
Operation of Spread Spectrum	)	
Transmitters with Directional	)	
Antennas	)	

To: The Commission

REPLY COMMENTS OF PINPOINT COMMUNICATIONS, INC.

Pinpoint Communications, Inc. ("Pinpoint"), by its attorneys, hereby replies to the comments filed in response to the above-captioned petition for rulemaking ("Petition") submitted by Western Multiplex Corporation.[1] Pinpoint, a developer of an automatic vehicle monitoring ("AVM") system designed to operate in the 902-928 MHz band, opposes the request of several commenters[2] to eliminate the requirements of the second sentence of Section 15.247(b) of the Commission's Rules as it applies to unlicensed spread spectrum point-to-point communications systems operating in that band. That provision requires transmitting antennas of Part 15 devices in the 902-928 MHz and other bands that have directional gain greater than 6 dBi to reduce their

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[1] The Petition was placed on Public Notice on February 16, 1994. Report No. 2000 (Mimeo. No. 41771).

[2] *See* Comments of Metricom, RM-8435 (filed March 18, 1994); Comments of Cylink Corporation, RM-8435 (filed March 18, 1994); Comments of Tetherless Access Ltd., RM-8435 (filed March 18, 1994).

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power by the amount in dB that the directional gain of the antenna exceeds 6 dBi.[3] Pinpoint expresses no opinion on whether the Commission should adopt the Petition and eliminate the requirements of this provision as it applies to the 2400-2483.5 MHz and 5725-5850 MHz bands.

INTRODUCTION AND STATEMENT OF INTEREST

Pinpoint has developed a high-capacity hyperbolic multilateration AVM technology known as the ARRAY™ system, which provides radiolocation and integrated data messaging services. Pinpoint recently obtained licenses in sixteen cities to construct and operate its ARRAY™ system in the 902-928 MHz band. This band is allocated for a number of uses, of which AVM is but one. In order of priority, the band may be used by Part 18 ISM devices, government radiolocation, AVM, amateur radio and, finally, unlicensed Part 15 devices.

At this time, in PR Docket No. 93-61, the Commission is conducting a rulemaking in which it has proposed to expand the current 18 MHz allocated to AVM in the 902-928 MHz band to the entire 26 MHz. As Pinpoint and others have demonstrated in that proceeding, the increasing demand for AVM services, both wide-area,[4] such as Pinpoint, and local-area, supports the proposed reallocation.

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[3] 47 C.F.R. § 15.247(b) (1992).

[4] "Wide-area" AVM systems employ a technology permitting the automatic location of a vehicle using an infrastructure where the range of fixed sites is on the order of several miles or more. While a few direction-finding location systems are employed elsewhere, all terrestrial wide-area vehicular system

(continued...)

The high capacity of the ARRAY™ network is achieved by spreading its signal over the widest bandwidth available.[5] Under the current interim allocation and rules, wide-area AVM systems are limited to 8 MHz contiguous bandwidth. Under final rules, Pinpoint hopes to be permitted to deploy systems using at least a 16 MHz occupied bandwidth.

If the Commission were to lift the restrictions on effective radiated power ("ERP") of Part 15 systems employing directional antennas, the potential for destructive interference from unlicensed devices to Pinpoint's ARRAY™ network would be increased significantly. Accordingly, Pinpoint has a vital interest in the outcome of this proceeding.

DISCUSSION

In recognition of the several uses authorized by the Commission in the 902-928 Mhz band, Pinpoint believes that AVM systems should be required to tolerate a reasonable level of interference from Part 15 devices.[6] While Part 15 devices should

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[4](...continued)
designs of which Pinpoint is aware employ hyperbolic multilateration techniques. "Local-area" area systems, in contrast, are those that operate over ranges of several hundred feet or less, for purposes such as automatic toll collection and tracking of our nation's rail cars.

[5] An experimental ARRAY™ system installed in Washington D.C. last summer achieved a vehicle location throughput of over 1000 position fixes per second (95 per cent were within a thirty foot accuracy) and 200 kbps in data messaging throughput using a signal with a 16 MHz bandwidth.

[6] *See* Reply Comments of Pinpoint Communications on Ex Parte Presentations, PR Docket No. 93-61 at 28-33 (filed March 29, 1994) (Pinpoint encouraged the Commission to adopt a quantitative definition of "harmful interference" in the 902-928 MHz band based on power received from a Part 15 device at an AVM receiver).

be permitted to continue to co-populate the band, Pinpoint submits that Part 15 devices, in reciprocity, must be required to adhere to their obligations not to cause interference to licensed systems.[7]

In 1990, when the Commission adopted Section 15.247(b), it noted that "the increased risk of interference due to high-gain directional antennas is a serious concern."[8] Those commenters seeking the repeal of the effective radiated power limitation contained in Section 15.247(b) fail to attempt to explain how the potential for interference that underlies the rule no longer persists. If the Commission were to modify or eliminate the rule, it would need to justify the change. In light of the growth of AVM systems, as evidenced in the record developed in Docket 93-61, the concern about interference to licensed systems would seem to be as great and serious as ever. Moreover, given that the Commission is considering the expansion of the AVM allocation while trying to maintain a reasonable balance among the uses authorized in the band, including spread spectrum Part 15 devices, Pinpoint submits that now is not the time to remove this restriction from the rules.

Power gains of 10 dB are easily achieved in the 902 - 928 MHz band and gains of 16 dB are certainly feasible.[9] With Part 15 devices mounted high atop outdoor structures, the unlicensed devices easily become surrogates for licensed point-to-point

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[7] 47 C.F.R. § 15.5(b) (1992).

[8] *Amendment of Parts 2 and 15*, Report and Order, 5 FCC Rcd 4123, 4127 (1990).

[9] A gain of 16 dB in a spread spectrum Part 15 device could result in an ERP of approximately 40 watts.

systems with powers equal to those of licensed local-area AVM systems, but with antennas located much higher than systems designed, for example, to read tags for the automatic payment of highway tolls. As a result, the interference potential of such unlicensed systems increases. Moreover, unlike licensed users of the band, there is no database to consult to facilitate ascertaining the location and ownership of the unlicensed facility, thereby impeding the satisfactory resolution of interference concerns.

Certainly the use of directional antennas by Part 15 devices should still be allowed in the 902-928 MHz band. However, if the power, or ERP, limits provided for in the rules are insufficient for satisfactory unlicensed operation, there are plenty of other ways in which the need can be met. The simplest is to use shorter radio links. Alternatively, the Commission has authorized unlicensed operations in a number of other bands, including not only the 2.4 and 5.8 GHz bands, in which the Petition seeks removal of the directional antenna ERP restriction, but 40 MHz recently allocated for Personal Communications Services.[10] In addition to these other unlicensed options, the Commission has made substantial provision for both common carrier and private point-to-point and point-to-multipoint services on a licensed basis.[11]

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[10] *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd. 7700 (1993).

[11] The Commission is also currently considering the allocation of 1000 mHz in the 28-29 GHz band for the Local Multipoint Distribution Service in CC Docket No. 92-297.

Notably, although the FCC has encouraged the deployment of Part 15 devices in the 902-928 MHz band over the past several years, it has always done so against the backdrop of the obligation of non-interfering operation.[12] Where reliable operation using Part 15 devices cannot be achieved because of power limits -- and Section 15.247(b) is effectively a power limit -- the Commission has, in the past encouraged radio system designers and users to turn to its licensed services. For example, when the Commission comprehensively revised the Part 15 rules in 1989 it stated:

> [I]t would appear that, wherever possible, operation under the authorized services would be preferable to operation under the Part 15 Rules. We therefore encourage parties that need to operate RF equipment at higher emission levels than those permitted herein to seek operation under other provisions of our Rules.[13]

If Section 15.247(b) is too restrictive for certain unlicensed spread spectrum devices in the 902-928 MHz band, this is still good advice.

CONCLUSION

In light of the ongoing AVM rulemaking in PR Docket No. 93-61, and the increasing use of the 902-928 MHz band by licensed services, Pinpoint submits that the public interest in minimizing the potential for harmful interference to licensed services requires the Commission to refrain at this time from proposing that the directional

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[12] 47 C.F.R. § 15.5(b).

[13] *Revision of Part 15*, First Report and Order, 4 FCC Rcd. 3493, 3502 (1989).

antenna ERP limit of Section 15.247(b) be deleted from the Rules in the 902-928 MHz band.

Respectfully submitted,

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April 4, 1994

CERTIFICATE OF SERVICE

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